

### **Remarks/Arguments:**

This is a reply to the office action of January 24.

Claims 28 - 33, 44 - 46 and 48 were rejected as anticipated by Voisin's Patent 3,874,440). Claims 41, 42, 49 and 50 were rejected as obvious over Voisin in view of Farkas (Patent 6499529). Claims 35 - 40, 43 - 44 and 47 were rejected as obvious over Voisin alone.

Claims 28 and 41 have been amended to better distinguish the invention from the prior art. Minor editorial changes have been made to other claims. The amended claims are deemed patentable over the art of record for reasons set out below.

As described in the prior art discussion of the present application, casting processes can be subdivided in two types: gravity casting processes and low pressure casting processes.

In a gravity casting process, the mold is provided with a lateral duct or channel for feeding molten metal from *above* to the mold cavity, for example by means of a bowl. In order to compensate for the shrinkage of the cooled metal and for releasing gases, the mold has at least a second duct which extends upwards from the cavity and which is open towards the outside (the atmosphere). These ducts are commonly known as open risers.

In the gravity casting process, molten metal is poured into the mold cavity (corresponding to the figure of the cast), in such a way it fills the cavity and the open risers. Afterwards, the feeding of the metal through the feeding channel is stopped and, as the metal shrinks, metal contained in the open risers is drawn by gravity towards the cavity.

In a low pressure casting process, the feeding channel or duct connects the mold cavity with a furnace placed *under* the mold. Open risers are completely absent, because the pressure exerted on the molten metal in the furnace compensates for shrinkage.

Voisin discloses a traditional low pressure casting mold and process, wherein the feeding pipe 18 connects the tank 8 with the mold cavity. The feeding pipe 18 of Voisin should not be confused with an open riser; the two are completely different to the skilled person for the reasons explained above. In fact, the pipe 18 of Voisin is not provided in the upper part of the mold, does not extend upwards from the mold cavity, and is not open towards the outside. In other words, the pipe 18 does not function as an accumulator for molten metal during the feeding phase, and cannot discharge metal into the mold as the metal shrinks.

The present invention, unlike Voisin, provides a hybrid device capable of performing either gravity casting or low pressure casting. The feature claimed in claim 28 that the mold has open risers which are subsequently closed by means of a plate, is very important because that makes it possible to use the mold for a traditional gravity casting process, just by leaving the risers open and closing the feeding duct in the bottom part of the mold. Thus, as explained in the description, the claimed invention gives the founder the ability to choose between a traditional gravity casting method and the newer low pressure casting method without changing the mold.

Compare Farkas, for example, in which a mold is used in which the riser 12 is not open upwardly and in which rotation thereof is necessary for feeding the mold cavities 16.

Neither Voisin nor the other cited documents disclose a casting process and a mold which combine a traditional gravity feeding of the molten metal by means of open risers and a traditional low pressure feeding from a furnace situated beneath the mold.

We submit, therefore, that claims 28 - 31 and 45 - 48 are novel and nonobvious over the prior art.

Finally, a casting machine according to claim 41, comprising a tilting arm hinged to the top for the movement of sealing means for sealing the open risers is neither known from nor rendered obvious by the cited references.

We believe that the claims now presented are novel over the prior art of record, and that this application is in proper form for allowance.

Respectfully submitted,

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